

**Amendments to the Claims:**

This listing of claims will replace all prior listings, and versions, of claims in the application.

**Listing of Claims**

1. (currently amended) A method comprising the steps of:
  - (a) providing cognitive training to an animal during rehabilitation of said animal from stroke ~~and after the acute phase of said stroke in said animal has ended~~ under conditions sufficient to produce an improvement in performance by said animal of a cognitive task whose deficit is associated with said stroke;
  - (b) administering a phosphodiesterase 4 inhibitor to said animal ~~before, during or after said providing step, a phosphodiesterase 4 inhibitor which enhances CREB pathway function, wherein said administering occurs~~ during rehabilitation of said animal from stroke ~~and after the acute phase of said stroke in said animal has ended,~~ wherein said inhibitor is administered in conjunction with said cognitive training and enhances CREB pathway function during said cognitive training;
  - (c) repeating said providing and said administering of steps (a) and (b) one or more times; and
  - (d) producing a long-lasting performance gain relative to the performance of said cognitive task achieved by training alone.
2. (withdrawn) The method of claim 1 wherein said animal has undergone neuronal stem cell manipulation.
3. (canceled)
4. (previously presented) The method of claim 1 wherein in step b), cognitive training comprises multiple training sessions.
5. (previously presented) The method of claim 4 wherein said phosphodiesterase 4 inhibitor is administered before and during each training session.
6. (original) The method of claim 1 wherein said animal is a mammal.

7. (original) The method of claim 6 wherein said mammal is a human.
8. (previously presented) The method of claim 1 wherein said phosphodiesterase 4 inhibitor induces CREB-dependent gene expression.
9. (withdrawn) The method of claim 8 wherein said augmenting agent up-regulates a positive effector of CREB pathway function.
10. (withdrawn) The method of claim 9 wherein said positive effector of CREB pathway function is a CREB activator.
11. (canceled)
12. (withdrawn) The method of claim 11 wherein said negative effector of CREB pathway function is a CREB repressor.
13. (withdrawn) The method of claim 1 wherein said augmenting agent is a CREB functional modulator.
- 14-20. (canceled)
21. (withdrawn) The method of claim 20 wherein said augmenting agent up-regulates a positive effector of CREB pathway function.
22. (withdrawn) The method of claim 21 wherein said positive effector of CREB pathway function is a CREB activator.
23. (canceled)
24. (withdrawn) The method of claim 23 wherein said negative effector of CREB pathway function is a CREB repressor.
25. (withdrawn) The method of claim 14 wherein said augmenting agent is a CREB functional modulator.

**26.** (withdrawn) A method of treating a cognitive deficit associated with age-associated memory impairment in an animal in need of said treatment comprising the steps of:

- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
- (b) training said animal under conditions sufficient to produce an improvement in performance by said animal of a cognitive task whose deficit is associated with age-associated memory impairment, whereby said cognitive deficit is treated.

**27.** (withdrawn) The method of claim 26 wherein a performance gain is achieved relative to the performance of said cognitive task achieved by training alone.

**28.** (withdrawn) The method of claim 26 wherein in step b), training comprises multiple training sessions.

**29.** (withdrawn) The method of claim 28 wherein said augmenting agent is administered before and during each training session.

**30.** (withdrawn) The method of claim 26 wherein said animal is a mammal.

**31.** (withdrawn) The method of claim 30 wherein said mammal is a human.

**32.** (withdrawn) The method of claim 26 wherein said augmenting agent induces CREB-dependent gene expression.

**33.** (withdrawn) A method of treating a cognitive deficit associated with a neurodegenerative disease in an animal in need of said treatment comprising the steps of:

- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
- (b) training said animal under conditions sufficient to produce an improvement in performance by said animal of a cognitive task whose deficit is associated with said neurodegenerative disease, whereby said cognitive deficit is treated.

- 34.** (withdrawn) The method of claim 33 wherein a performance gain is achieved relative to the performance of said cognitive task achieved by training alone.
- 35.** (withdrawn) The method of claim 33 wherein said neurodegenerative disease is selected from the group consisting of: delirium, dementia, Alzheimer's disease, Parkinson's disease and Huntington's disease.
- 36.** (withdrawn) The method of claim 33 wherein in step b), training comprises multiple training sessions.
- 37.** (withdrawn) The method of claim 36 wherein said augmenting agent is administered before and during each training session.
- 38.** (withdrawn) The method of claim 33 wherein said animal is a mammal.
- 39.** (withdrawn) The method of claim 38 wherein said mammal is a human.
- 40.** (withdrawn) The method of claim 33 wherein said augmenting agent induces CREB-dependent gene expression.
- 41.** (withdrawn) A method of treating a cognitive deficit associated with a psychiatric disease in an animal in need of said treatment comprising the steps of:
- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
  - (b) training said animal under conditions sufficient to produce an improvement in performance by said animal of a cognitive task whose deficit is associated with said psychiatric disease, whereby said cognitive deficit is treated.
- 42.** (withdrawn) The method of claim 41 wherein a performance gain is achieved relative to the performance of said cognitive task achieved by training alone.
- 43.** (withdrawn) The method of claim 41 wherein said psychiatric disease is selected from the group consisting of: depression, schizophrenia, autism and attention deficit disorder.

- 44.** (withdrawn) The method of claim 41 wherein in step b), training comprises multiple training sessions.
- 45.** (withdrawn) The method of claim 44 wherein said augmenting agent is administered before and during each training session.
- 46.** (withdrawn) The method of claim 41 wherein said animal is a mammal.
- 47.** (withdrawn) The method of claim 46 wherein said mammal is a human.
- 48.** (withdrawn) The method of claim 41 wherein said augmenting agent induces CREB-dependent gene expression.
- 49-58.** (canceled)
- 59.** (withdrawn) The method of claim 57 wherein said trauma dependent loss of function is selected from the group consisting of: head trauma and brain trauma.
- 60-64.** (canceled)
- 65.** (withdrawn) A method of treating a cognitive deficit associated with a genetic defect in an animal in need of said treatment comprising the steps of:
- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
  - (b) training said animal under conditions sufficient to produce an improvement in performance by said animal of a cognitive task associated with said genetic defect, whereby said cognitive deficit is treated.
- 66.** (withdrawn) The method of claim 65 wherein a performance gain is achieved relative to the performance of said cognitive task achieved by training alone.
- 67.** (withdrawn) The method of claim 65 wherein said genetic defect is selected from the group consisting of: Rubinstein-Taybi syndrome and down syndrome.

- 68.** (withdrawn) The method of claim 65 wherein in step b), training comprises multiple training sessions.
- 69.** (withdrawn) The method of claim 68 wherein said augmenting agent is administered before and during each training session.
- 70.** (withdrawn) The method of claim 65 wherein said animal is a mammal.
- 71.** (withdrawn) The method of claim 70 wherein said mammal is a human.
- 72.** (withdrawn) The method of claim 65 wherein said augmenting agent induces CREB-dependent gene expression.
- 73.** (withdrawn) A method of improving learning in an animal with a learning disability comprising the steps of:
- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
  - (b) training said animal under conditions sufficient to produce an improvement in performance by said animal of a cognitive task whose deficit is associated with said learning disability, whereby learning is improved.
- 74.** (withdrawn) The method of claim 73 wherein a performance gain is achieved relative to the performance of said cognitive task achieved by training alone.
- 75.** (withdrawn) The method of claim 73 wherein in step b), training comprises multiple training sessions.
- 76.** (withdrawn) The method of claim 75 wherein said augmenting agent is administered before and during each training session.
- 77.** (withdrawn) The method of claim 73 wherein said animal is a mammal.
- 78.** (withdrawn) The method of claim 77 wherein said mammal is a human.

**79.** (withdrawn) The method of claim 73 wherein said augmenting agent induces CREB-dependent gene expression.

**80.** (withdrawn) A method for repeated stimulation of neuronal activity or a pattern of neuronal activity in an animal comprising the steps of:

- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
- (b) training said animal under conditions sufficient to stimulate neuronal activity or a pattern of neuronal activity in said animal.

**81.** (withdrawn) The method of claim 80 wherein in step b), training comprises multiple training sessions.

**82.** (withdrawn) The method of claim 81 wherein said augmenting agent is administered before and during each training session.

**83.** (withdrawn) The method of claim 80 wherein said animal is a mammal.

**84.** (withdrawn) The method of claim 83 wherein said mammal is a human.

**85.** (withdrawn) The method of claim 80 wherein said augmenting agent induces CREB-dependent gene expression.

**86.** (withdrawn) A method of therapy of a cognitive deficit associated with a central nervous system disorder or condition in an animal having undergone neuronal stem cell manipulation comprising the steps of:

- (a) administering to said animal an augmenting agent which enhances CREB pathway function; and
- (b) training said animal under conditions sufficient to stimulate neuronal activity or a pattern of neuronal activity in said animal.

**87.** (withdrawn) The method of claim 86 wherein training in step b) further produces an improvement in performance by said animal of a cognitive task whose deficit is associated with said central nervous system disorder or condition.

**88.** (withdrawn) The method of claim 87 wherein a performance gain is achieved relative to the performance of said cognitive task achieved by training alone.

**89.** (withdrawn) The method of claim 86 wherein in step b), training comprises multiple training sessions.

**90.** (withdrawn) The method of claim 89 wherein said augmenting agent is administered before and during each training session.

**91.** (withdrawn) The method of claim 86 wherein said animal is a mammal.

**92.** (withdrawn) The method of claim 91 wherein said animal is a human.

**93.** (withdrawn) The method of claim 86 wherein said augmenting agent induces CREB-dependent gene expression.

**94-99.** (canceled)

**100.** (currently amended) The method of claim ~~98~~ 1 wherein in step ~~(b)~~ (a), cognitive training comprises multiple training sessions.

**101.** (currently amended) The method of claim ~~98~~ 1 wherein said phosphodiesterase 4 inhibitor is administered before and during each training session.

**102.** (currently amended) The method of claim ~~98~~ 1 wherein said animal is a mammal.

**103.** (previously presented) The method of claim 102 wherein said mammal is a human.

**104.** (currently amended) The method of claim ~~98~~ 1 wherein said phosphodiesterase 4 inhibitor induces CREB-dependent gene expression.

**105-106.** (canceled)

**107.** (new) A method comprising the steps of:

- (a) providing cognitive training to a patient who has suffered impaired cognitive function after a stroke under conditions sufficient to produce an improvement in performance by said patient of a cognitive task whose deficit is associated with said stroke;
- (b) administering a phosphodiesterase 4 inhibitor training to said patient, wherein the inhibitor is administered in conjunction with said cognitive training and enhances CREB pathway function during said cognitive training;
- (c) repeating said providing and said administering of steps (a) and (b) one or more times; and
- (d) producing a long-lasting performance gain relative to the performance of said cognitive task achieved by training alone.

**108.** (new) A method comprising the steps of:

- (a) providing cognitive training to a patient who has suffered impaired sensory-motor function after a stroke under conditions sufficient to produce an improvement in performance by said patient of a cognitive task whose deficit is associated with said stroke;
- (b) administering a phosphodiesterase 4 inhibitor to said patient, wherein the inhibitor is administered in conjunction with said cognitive training and enhances CREB pathway function during said cognitive training;
- (c) repeating said providing and said administering of steps (a) and (b) one or more times; and
- (d) producing a long-lasting performance gain relative to the performance of said cognitive task achieved by training alone.